Applicants respectfully request reconsideration and allowance of the claims in view of the following arguments.

The present invention relates to a polygon scanning system and method wherein two or more light beams impinge at different incident angles at substantially the same incident location on a polygon facet, and are sequentially used for scanning the surface of a substrate as the polygon is rotated. Embodiments include a system comprising a polygon having a reflective facet, a rotation mechanism for rotating the polygon, and a light source for directing a plurality of light beams to impinge on the facet such that each light beam impinges on the facet at a different incident angle. Each light beam is reflected by the facet to scan a particular portion of a surface of a substrate during a respective time interval when the rotation mechanism is rotating the polygon. Each of the plurality of light beams is reflected onto the substrate surface using a respective portion of the facet surface, such that the sum of the respective portions of the facet surface used to reflect the light beams is a very large percentage of the total surface area. Thus, the system has a duty cycle of close to 100 percent, as well as a high data rate.

Regarding the obviousness rejection of independent claims 1, 15, 16 and 22 based on Flint and Hayashi, it is admitted in the Office Action that the Flint reference does not disclose or suggest that its plural light beams all impinge on the reflective facet of the polygon at substantially the same incident location, as recited in these claims. However, it is contended in the Office Action that Hayashi furnishes the teaching of two light beams that impinge on the same incident location, and that it would have been obvious to combine Flint and Hayashi to yield the invention of claims 1, 15, 16 and 22.

Applicants disagree. In the scanner of Flint, shown in Flint's Fig. 2, two light beams impinge on a polygon facet 234 at two separate incident locations 231, 232. Flint explains, at

col. 10:44-52, that the second incident location 232 is "spatially separated" from the first incident location 231, and that the incident locations are arranged in a row along the perimeter of the polygon. Flint further discloses that, in the case where there are more than two light beams used, each incident location is separated by an approximately equal distance from the adjacent incident locations (col. 6:59-61). Flint's apparatus uses the above-discussed linear arrangement of spaced-apart incident locations to function as a progressive scanner for displaying a two-dimensional image (i.e., a video image).

Hayashi teaches a multi-beam scanning apparatus having a plurality of light sources which are modulated to scan a plurality of lines simultaneously on a scanning surface (see, e.g., Hayashi col. 1:12-17) after impinging on a single location on a facet of a rotating polygon, as shown in Figs. 1 and 2 of Hayashi and described in the Office Action.

Even if Flint's scanner was modified as suggested in the Office Action to incorporate this feature of Hayashi, the resulting combination would not yield the invention of independent claims 1, 15, 16 or 22. Such a Flint/Hayashi combination would have two light sources *simultaneously* impinging on the same incident location on Flint's polygon facet 234, for the purpose of scanning two lines at once, as taught by Hayashi. However, it would not meet the requirement of independent claims 1 and 16 that the second light beam impinge on the facet at the incident location, to be reflected by the facet and scan a second portion of the surface of the substrate during a *second time interval subsequent to a first time interval* (when the first light beam impinges on the incident location). Likewise, it would not meet the analogous requirement of claims 15 and 22 that the plural light beams impinge on the facet at the incident location, each light beam to be reflected by the facet and scan a respective portion of the surface of the substrate during a *respective time interval.*

In the claimed invention, each light beam is reflected by the facet to scan a different portion of a surface of a substrate during a different respective time interval. This feature of the claimed invention enables each of the plurality of light beams to be reflected onto the substrate surface using a different respective portion of the facet surface, such that the sum of the respective portions of the facet surface used to reflect the light beams is a very large percentage of the total surface area, thereby increasing the duty cycle. In contrast, in the theoretical Flint/Hayashi combination suggested by the Examiner, each of the multiple light beams would be reflected by the facet to scan a different portion of a substrate surface during the *same* time interval.

Thus, even if Flint and Hayashi were to be combined, their combination would not render the invention of independent claims 1, 15, 16 or 22 obvious, because it would lack an apparatus for, or step of, impinging more than one light beam on a polygon facet at different incident angles at substantially the same incident location, during subsequent/respective time intervals.

Further regarding independent claims 15 and 22, neither Flint nor Hayashi teaches or suggests that the sum of the respective portions of the facet surface used to reflect the light beams is greater than 90 percent of the total surface area, as required by these claims. This limitation refers to the duty cycle of the polygon, which is known by those skilled in the art to be the portion of the surface area of the polygon facet used for scanning (see page 1 of the present application). It is contended at page 4 of the Office Action that this feature is inherent in Flint. However, there is no support offered for this contention. Moreover, this contention directly contradicts Flint's disclosure.

It is well-established that to rely on a theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to support the determination that the allegedly inherent

characteristic necessarily flows from the teachings of the applied prior art. ***Ex parte Levy***, 17 USPQ2d 1461, 1464 (Bd.Pat.App. & Inter. 1990); **MPEP** § 2112. In the present case, the Examiner has provided no such basis in fact or technical reasoning, but has simply made a bare statement. The Examiner's comment alleging the first and second portions of the substrate surface are the same is irrelevant, since claims 15 and 22 do not even recite first and second portions of the substrate. Furthermore, the limitation of claims 15 and 22 at issue here relates to the portions of the *facet surface* used to reflect the light beams in relation to the *total surface area of the facet*, not the substrate surface area.

More importantly, Flint explicitly teaches that it has a different duty cycle than that which is claimed. Flint's apparatus requires a linear arrangement of spaced-apart incident locations on its polygon facet to function as a progressive scanner for displaying a two-dimensional image (i.e., a video image). As a result, Flint states that its apparatus has a duty cycle of "slightly less than 50%" (see Flint col. 5:13-22). In contrast, independent claims 15 and 22 require a duty cycle of greater than 90 percent. Still further, combining Flint with Hayashi will not necessarily result in an apparatus having the claimed duty cycle. The duty cycle of a Flint/Hayashi combination would not be greater than Flint's duty cycle. In the theoretical Flint/Hayashi combination suggested by the Examiner, each of the multiple light beams would be reflected by the facet to scan a different portion of a substrate surface simultaneously. In this arrangement, each of the plurality of light beams would be reflected onto the substrate surface using the same portion of the facet surface. The duty cycle of Flint would therefore not be increased, although the resolution may or may not be improved, as suggested by the Examiner in the Office Action.

Thus, the Examiner has no logical basis to conclude that the 90 percent or greater duty cycle specified in claims 15 and 22 is inherent in Flint, or in any Flint/Hayashi combination.

Consequently, independent claims 1, 15, 16 and 22 are patentable, as are claims 2, 3, 6, 7, 10-14, 17, 19-21, 23-25, 27-29 and 31-33, which depend from claims 1, 15, 16 and 22, respectively.

Regarding the obviousness rejection of dependent claims 4, 5, 18, 26 and 30 based on Flint and Hayashi, these claims are patentable by virtue of their dependency from independent claims 1 and 16.

Regarding the obviousness rejection of dependent claims 8 and 9 based on Flint, Hayashi and Fantuzzo, the Fantuzzo reference does not disclose or suggest the feature of claim 1 (from which claims 8 and 9 depend) missing from Flint and Hayashi, of a second light source for directing a second light beam to impinge on the facet at substantially the incident location of the first light beam *during a second time interval subsequent to the first time interval.* As discussed above, Hayashi teaches (at Fig. 1) directing a second light beam to *simultaneously* impinge on a facet at the incident location of the first light beam. Therefore, any combination of Flint, Hayashi and Fantuzzo, however made, would still be missing the claimed second light source, and it would not have been obvious to add this feature to any Flint/Hayashi/Fantuzzo combination.

Consequently, claims 8 and 9 are patentable.

Reconsideration and withdrawal of the rejections of the claims under 35 U.S.C. § 103 are respectfully requested.

Accordingly, it is believed that all pending claims are now in condition for allowance. Applicant therefore respectfully requests an early and favorable reconsideration and allowance of

this application. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicant's representative at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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